Chapter 1
INTRODUCTION

PURPOSE AND SCOPE

The South Florida Water Management District (SFWMD or District) has undertaken development of long-term comprehensive regional water supply plans to provide better management of South Florida's water resources. The purpose of the water supply plans is to develop strategies to meet the future water demands of urban areas and agriculture, while meeting the needs of the environment. This process identifies areas where historically used sources of water will not be adequate to meet future demands, and evaluates several water source options to meet the deficit. The Upper East Coast (UEC) Planning Area is one of four regional planning areas, as indicated in Figure 1. These regions are generally defined by hydrologic divides.

This Upper East Coast Water Supply Plan Support Document (originally the UEC Background Document) provides a common set of data, assumptions, and potential water source options that were used by the District, advisory committee, other agencies, counties, municipalities, utilities, and various interested parties in the development of the UEC Water Supply Plan. This support document contains key data such as present and future water demands that was used for the analytical process during plan development. The computer modeling and analysis used to develop the water supply plan, as well as the plan development process, are summarized in this document.

Local governments, water users, and utilities may use the water supply plan to modify and update their local comprehensive plans, ordinances, and individual or utility plans.

BASIS OF WATER SUPPLY PLANNING

Legal Authority and Requirements

The District is charged by the Florida Legislature with managing water use in South Florida. One important task in this charge is planning for future water demand in specific geographic regions within the District. In partial fulfillment of this requirement, the District prepared a water supply plan for the UEC Planning Area. The following discussion describes the legal basis for the District's water supply planning program. Excerpts of specific Florida statutes and administrative codes cited in this section are provided in Appendix A.

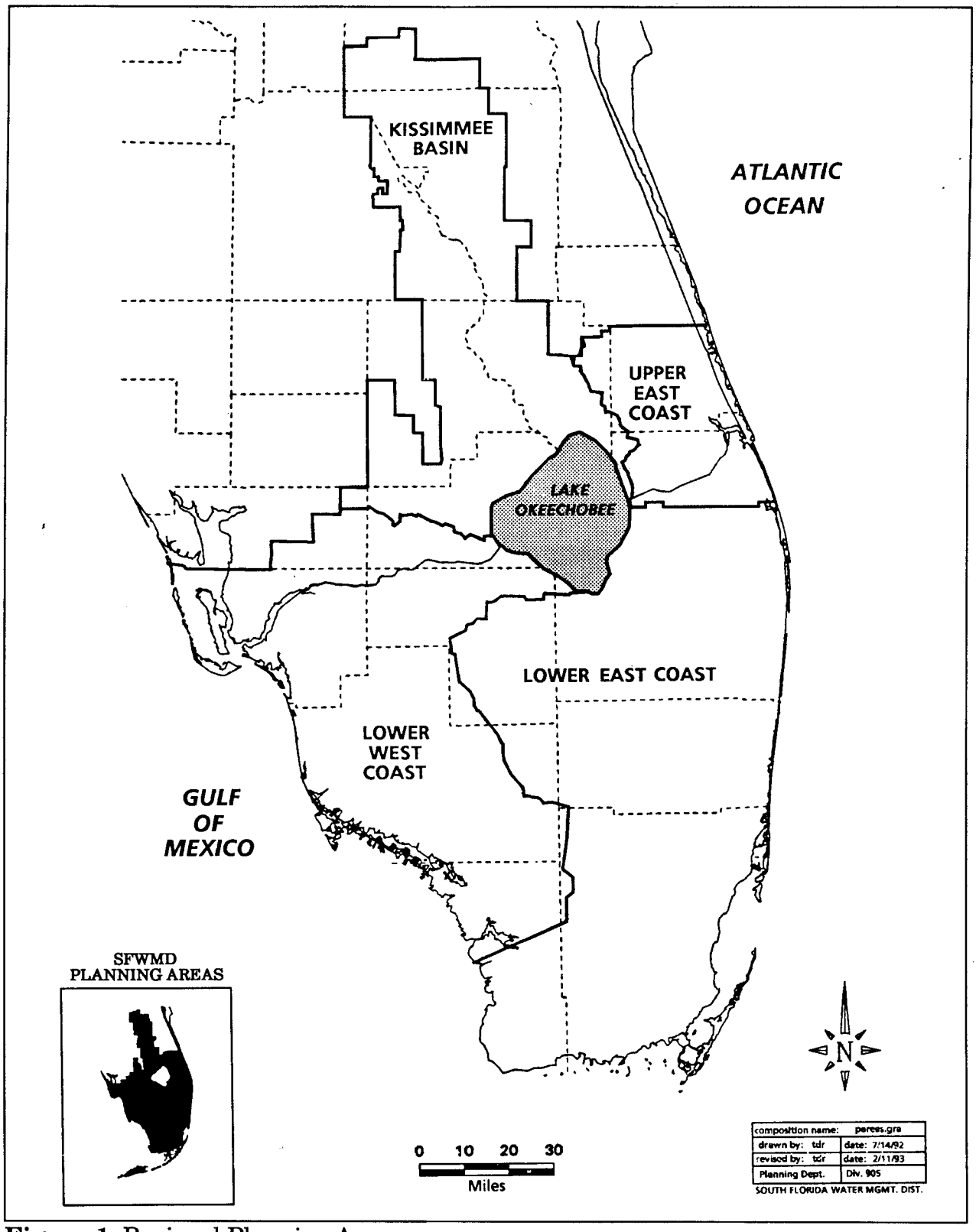

Figure 1. Regional Planning Areas.

Water supply planning activities were first required of the state's water management districts following adoption of the Florida Water Resources Act of 1972 (Chapter 373, Florida Statutes). The authors of "A Model Water Code" (Maloney *et al*., 1972), upon which much of Chapter 373 is based, theorized that proper water resource allocation could best be accomplished within a statewide, coordinated planning framework. The State Water Use Plan and the State Water Policy were the primary documents to meet this objective.

During the 1997 legislative session, significant amendments were made to the Water Resources Act. The amendments clarified agency responsibilities related to regional water supply planning and included many of the provisions of the Governor's Executive Order 96-297. The Executive Order directs Florida's water management districts to establish minimum flows and levels and to complete regional water supply plans in areas where sources are not adequate to meet future demands.

Prior to these legislative amendments, the Water Resources Act required the Florida Department of Environmental Protection to prepare a State Water Use Plan. The State Water Use Plan defined objectives and operating policies which implemented selected goals and policies of the State Comprehensive Plan (Ch. 187, F.S.). Chapter 187 provides guidance for all state agencies as they develop their "agency functional plans," and to the water management districts, as they develop their water management plans. More specific guidelines for these plans are provided in the State Water Policy (now referred to as the Water Resource Implementation Rule), Ch. 62-40, F.A.C.

With the passage of the legislative amendments, the Legislature eliminated the State Water Use Plan and provided for the development of the Florida Water Plan. The Florida Water Plan is required to include the Water Resource Implementation Rule and District Water Management Plans.

The Water Resource Implementation Rule is intended to guide the Florida Department of Environmental Protection and the water management districts in implementing statutory directives prescribed in the Water Resources Act (Ch. 373, F.S.), the Florida Air and Water Pollution Control Act (Ch. 403, F.S.), and the State Comprehensive Plan (Ch. 187, F.S.), These statutes provide the basic authorities, directives, and policies for statewide water management, pollution control, and environmental protection. The current legal framework for water supply planning is shown in Figure 2.

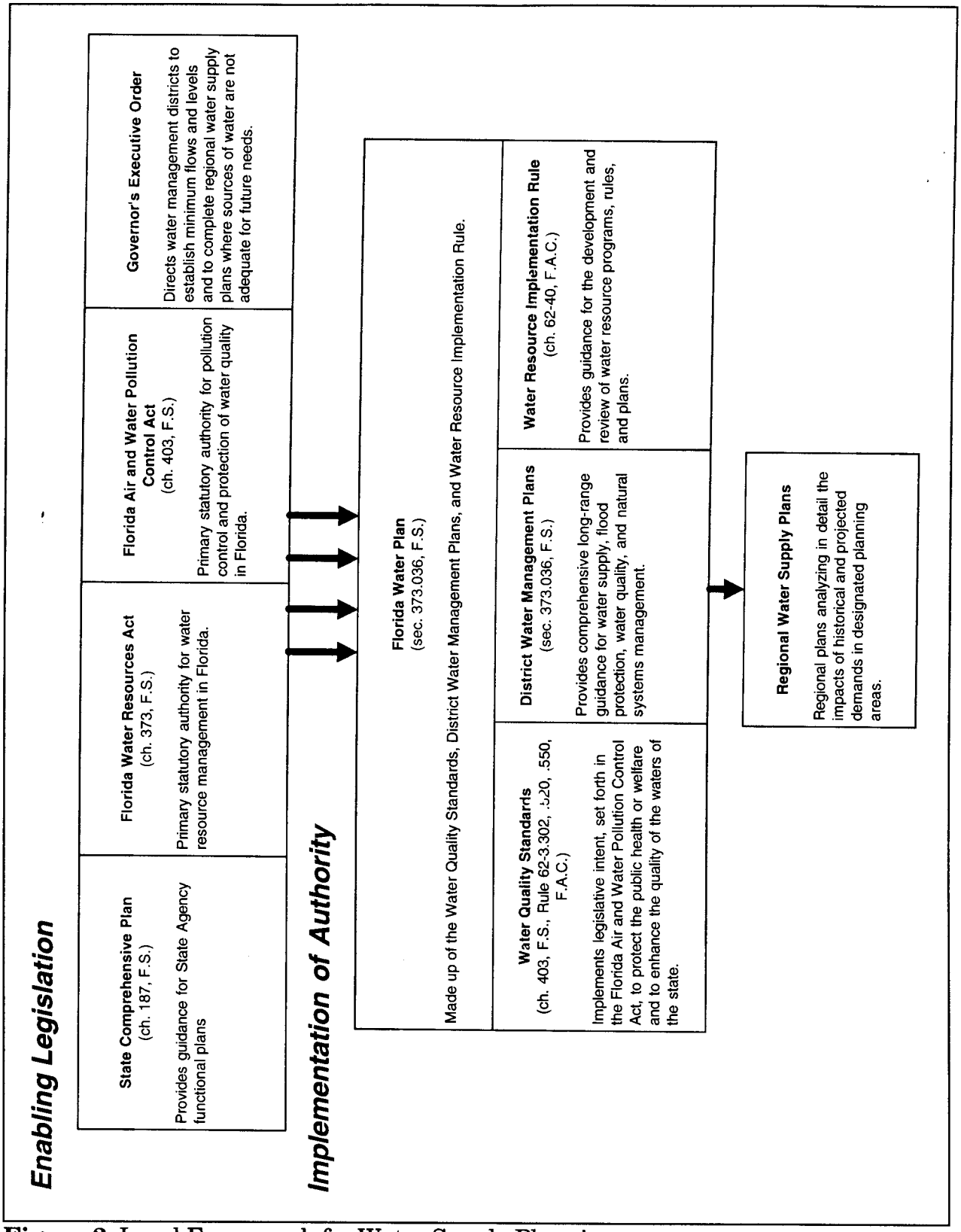

Figure 2. Legal Framework for Water Supply Planning.

District Water Management Plans are intended to provide comprehensive long-range guidance for the actions of the water management districts in implementing their responsibilities under state and federal laws. In addition to other information, the water management plans are required to include a district-wide water supply assessment. Where the assessment indicates that sources of water are not adequate to meet demands, a regional water supply plan is required to be developed. The SFWMD preempted this requirement by committing to a water supply planning initiative in the early 1990s that included developing water supply plans encompassing the entire District. The UEC Water Supply Plan development and analysis were substantially complete prior to the legislative amendments.

Water Supply Planning Initiative

The District has undertaken a water supply planning initiative to ensure prudent management of South Florida's water resources. This initiative includes the development of a Water Supply Policy Document, Water Supply Needs and Sources Document, Water Management Plan, and regional water supply plans.

Water Supply Policy Document

This direction-setting document is the SFWMD's interpretative summary of the many state statutes and rules governing the uses of surface and ground waters in Florida. The Water Supply Policy Document was accepted by the Governing Board in December 1991.

Water Supply Needs and Sources Document

Rule 62-40.520, F.A.C., requires water management districts to prepare water management plans, which include assessments of water needs and supply sources. The District, through discussions with the FDEP, bifurcated this process, and prepared a district-wide needs and sources analysis followed by regional water supply plans. The Water Supply Needs and Sources Document (July 1992) made a preliminary analysis of the District's water demand and available resources. Significant roles which this initial document served was the provision of information to local governments pursuant to Sections 373.0391 and 373.0395, F.S., and facilitating the completion of the District Water Management Plan.

The District Water Management Plan (April 1995) incorporated information from the Needs and Sources Document. Subsequent water management plans will include district-wide water supply assessments.

District Water Management Plan

The Water Management Plan represents the District's overall strategy for future planning and implementation activities and provides a comprehensive examination of the myriad issues of water supply, flood protection, water quality, and natural systems management in South Florida. This plan also established schedules for future District planning activities, including the Upper East Coast Water Supply Plan. The District published its Water Management Plan in April 1995, and will update the plan every five years.

Regional Water Supply Plans

Regional water supply plans provide more detailed region-specific information than the water supply assessments. Water supply plans are based upon data that are related to the specific water needs, sources and environmental features of regional planning areas, and are updated every five years. Area-specific goals and objectives were developed for the UEC Water Supply Plan during the water supply planning process.

Other Related Activities

The District has other activities with direct relationships to the water supply planning initiative (Table 1). These activities have elements that may affect or be affected by the results of water supply planning analyses.

Incorporation of State Directives into District Water Supply Goals

The District has committed to an overall water resources goal. This goal is derived from the State Comprehensive Plan, which states:

> Florida shall assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial and shall maintain the functions of natural systems and the overall present level of surface and ground water quality. Florida shall improve and restore the quality of waters not presently meeting water quality standards.

This goal will be achieved by balancing six principal water use directives embodied in Florida law (Figure 3). The state's policies endorse conservation of available supplies, diversification of potential supply sources, protection and enhancement of water quality, and protection of environmental resources. At the same time, the state and the District are sensitive to the requirements of the region's population, and the need to provide clean water for drinking, other domestic uses, and agriculture.

Table 1. Upper East Coast Related Water Management Planning Efforts.

	Scope/Primary Goal	Relationship to UECWSP	Timeframes
UEC Water Supply Plan	Adequate and reliable water supply	N/A	1998
Indian River Lagoon SWIM Plan	Restoration of IRL and SLE	-Provides water quality and quantity targets for IRL and SLE	Update initiated in 1998
IRL Restoration Feasibility Study	Regional solutions to manage freshwater discharges to IRL and SLE and restoration of impacted watershed wetlands	-Evaluates options to meet SLE inflow range -Explore potential for supplemental water supply for agriculture -Provide detailed information needed for implementation	2001
Lake Okeechobee (L.O.) SWIM Plan	Protection and enhancement of Lake Okeechobee and its watershed (water quality)	-Backflow/inflow from C-44 Canal. -Potential C-131 backpumping if determined viable in IRL Feasibility Study.	Update completed 1997
Lake Okeechobee Regulation Schedule Environmental Impact Study	Evaluates environmental and economic impacts associated with proposed L.O. Regulation Schedules (quantity)	-Discharges from L.O. to SLE	1999
C&SF Project Restudy	Comprehensive review of environmental impacts of C&SF project	-Discharges from L.O. to SLE	1995-1999
IRL National Estuary Program Comprehensive Conservation and Mgmt. Plan	EPA program for IRL restoration	-Supports activities to enhance the IRL and SLE Creates framework for: -Identification of funding sources -Identification of lead/support partnering	1996
Lower East Coast Water Supply Plan	Adequate and reliable water supply for the Lower East Coast, for natural systems L.O. service area	-Water supply to C-44 basin -Minimum and maximum flows to SLE from L.O. -Potential C-131 if determined viable in IRL Feasibility Study	Interim Plan 1998

WATER USE DIRECTIVES

1. Prevent wasteful, uneconomical, impractical, or unreasonable uses of the water resources.
2. Promote economic development of the water resources consistent with other directives and uses.
3. Protect and enhance environmental resources while providing appropriate levels of service for drainage, flood control, water storage, and water supply.
4. Maximize levels of service for legal users, consistent with other directives.
5. Preserve and enhance the quality of the state's ground and surface waters.
6. Develop and maintain resource monitoring networks and applied research programs (such as forecasting models) required to predict the quantity and quality of water available for reasonable-beneficial uses.

Source: SFWMD, 1991, Water Supply Policy Document.

Figure 3. SFWMD's Water Use Directives.

PLANNING PROCESS

The Upper East Coast water supply planning process consisted of four overlapping phases: background work; analysis/issue identification; solution development; and implementation (Figure 4).

Background Work

Background work included gathering information for the region describing water resources, rainfall patterns, natural resources, historical and projected water demands, water conservation programs, and land use coverage that could be useful in developing the plan. This information was compiled into the UEC Water Supply Plan Background Document (October 1994), which is now the Support Document. The background work also included development and calibration of analytical tools used in the development of the UEC Water Supply Plan, including ground water models and surface water budgets.

Figure 4. Planning Process Components.

An advisory committee was also established to provide public input throughout the planning process. Advisory committee meetings were held that facilitated the planning process, including the following: initial information sharing, issue identification, goal formulation, evaluation of modeling results, identification of possible solutions, strategy development, and draft plan document review. The advisory committee adopted the water resource goal of the State Comprehensive Plan as the overall goal of the UEC Water Supply Plan (page 6). To ensure that the water supply plan addresses the specific needs of the region, the committee also developed the following regional goals (no implied priority):

- Water Supply: Promote the use of water supply alternatives and conservation
- Floridan Aquifer: Establish water quality criteria limitations for the Floridan Aquifer System (FAS) within the UEC
- Wetland Protection: Protect wetland systems from significant harm due to water use drawdowns
- Saltwater Intrusion: Develop criteria and programs for Surficial Aquifer System protection from saltwater intrusion
- Level of Drought: Establish a level of certainty (annual rainfall event, expressed in terms of return frequency) for all permitted uses and for the environment
- Flood Protection: Consider flood protection during the water supply planning process
- Consistency with Local Governments: Promote compatibility between the UEC Water Supply Plan and local land use decisions and policies
- Estuary: Protect and enhance the St. Lucie Estuary and Indian River Lagoon
- Linkages with other Regional Planning Efforts: Promote compatibility and integration with other related regional water resource planning efforts, including Indian River Lagoon (IRL) SWIM Plan, IRL Restoration Feasibility Study, Lake Okeechobee SWIM Plan, Lake Okeechobee Regulation Schedule Study, Lower East Coast Water Supply Plan, Central and Southern Florida Comprehensive Review Study (a.k.a.: Restudy), the IRL National Estuary Program Comprehensive Conservation and Management Plan, Regional Attenuation Facility Task Force, Strategic Regional Policy Plan, St. Johns River Water Management District Needs and Sources

Analysis/Issue Identification

Analytical tools were used extensively to identify the potential issues of the region. The analysis phase included the use of ground water models, surface water budgets, and vulnerability mapping. The ground water models were used to identify potential impacts of water use on the environment and ground water resources. Surface water budgets were used to approximate surface water availability in each of the major surface water basins in order to quantify demands that could not be satisfied by surface water. Vulnerability mapping was used to identify areas that have the highest potential for saltwater intrusion in the Surficial Aquifer System.

Based on this analysis, issues relating to water supply were identified. Devising strategies to resolve these issues was the next step.

Solution Development

In areas where projected demands had the potential to exceed available supplies, there was a need to devise solutions. Potential solutions included increased use of water conservation and water source options which are described in chapters 7 and 8. Each water source option was evaluated, and local and regional responsibilities were identified for each.

Implementation

Concepts resulting from the solution development phase will be translated into strategies that will be implemented by the relevant departments within the District (Figure 5) and other responsible parties. Developing strategies and building partnerships for future implementation efforts will be emphasized.

PUBLIC AND AGENCY PARTICIPATION

Public and agency involvement was critical in the preparation of the UEC Water Supply Plan. The steps listed below were taken by the District to ensure adequate public input.

Advisory Committee

A 30-member water supply plan advisory committee was established in September 1995 to provide public input through out the planning effort. The committee consisted of representatives from interested and effected parties in the planning area (Table 2).

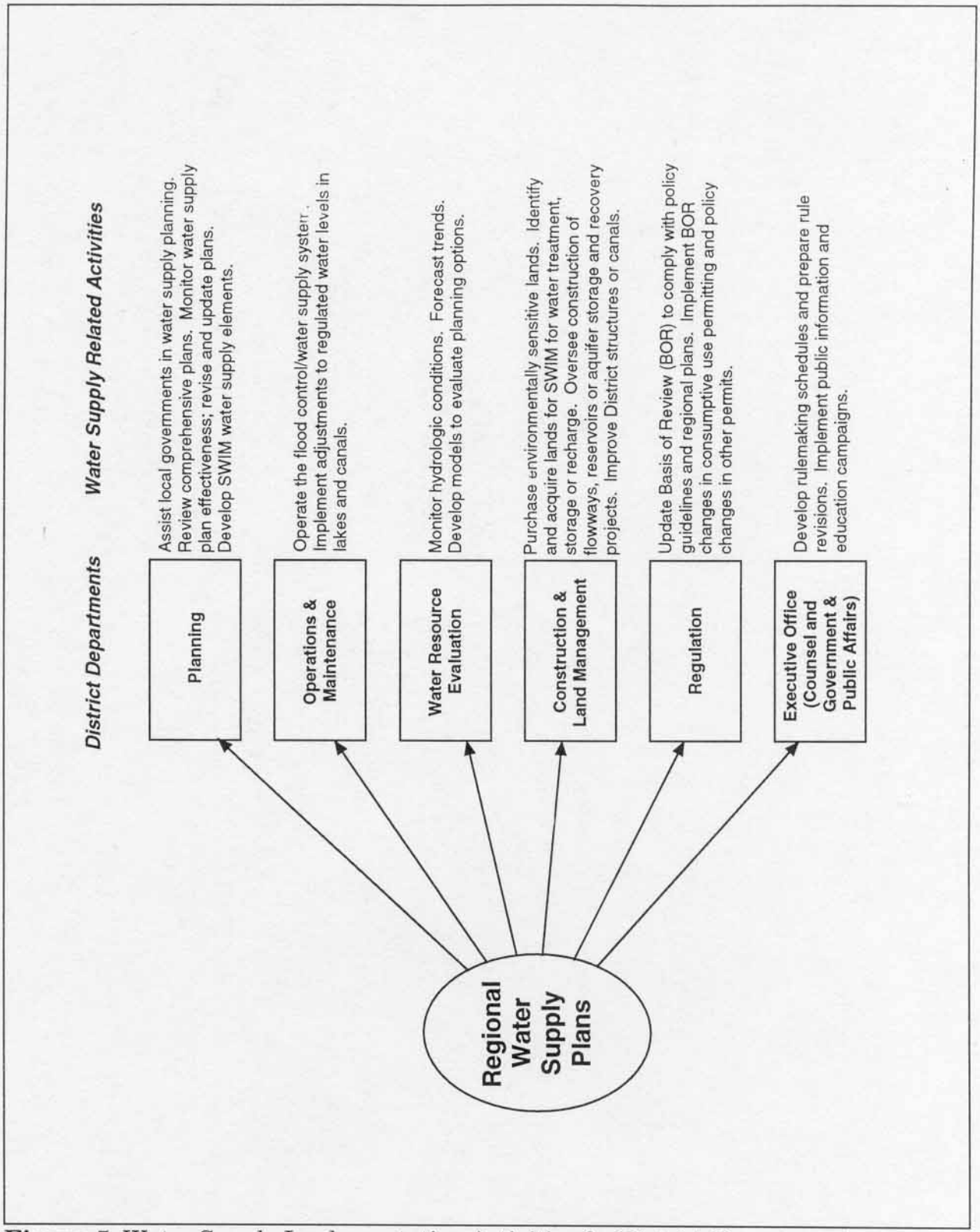

Figure 5. Water Supply Implementation Activities for District Departments.

Table 2. Composition of Advisory Committee.

Government/Agency	Utilities
Federal U.S. Army Corps of Engineers U.S. Geological Survey **State** Department of Community Affairs Department of Environmental Protection SFWMD Governing Board **Regional** Treasure Coast Regional Planning Council **Local** Martin County Board of County Commissioners Port St. Lucie Planning Department St. Lucie County Community Development St. Lucie County - Public Works	Martin County Utilities Hobe Sound Water Company Hydratech Utilities City of Stuart Public Works Port St. Lucie Utilities Fort Pierce Utilities
	Agriculture Institute of Food and Agricultural Science St. Lucie Soil and Water Conservation District St. Lucie County Chamber of Commerce - Agribusiness Indian River Citrus League Camayen Cattle Company
Environmental St. Lucie River Initiative Martin County Conservation Alliance Conservation Alliance of St. Lucie County	**Economic** St. Lucie County Chamber of Commerce Economic Council of Martin County
	Golf Course Turfgrass Association
Local Drainage Districts North St. Lucie River Water Control District	**Development** Treasure Coast Builders Association

The advisory committee met 25 times. During advisory committee meetings, water supply issues and potential water source options were explored. Information exchanged during these meetings proved useful in developing strategies for future water supply activities.

Local Government Linkage

Local government linkage meetings were established in January 1997 to better link the UEC Water Supply Plan with local government planning efforts. These meetings provided a forum for District and local government planners to exchange information on a variety of topics. Discussion topics included plan updates, new development projects, and the role of water supply planning in local land use planning, These meetings also furthered Goal 7 of the UEC Water Supply Plan which promotes compatibility between the UEC Water Supply Plan and local land use decisions and policies. Five linkages meetings were conducted in 1997. Periodic meetings will be held during implementation of the plan.

Data Confirmation

The technical information incorporated into this support document was the basis for discussions of water demand and availability in the UEC Planning Area; it was also the key data for analysis (i.e., predictive modeling and analysis of water management alternatives) of the water resources. Therefore, it is important that this information is accurate so that the most appropriate solutions are presented.

The District initiated data collection and preliminary planning efforts for the UEC Support Document (formerly the Background Document) in 1992. As part of this effort, many entities, such as local governments, state and federal agencies, environmental groups, agricultural interests, and utilities within the UEC Planning Area, were contacted to gather initial input and information, and informal meetings were held with several of these groups. Two examples where public input was utilized to generate and/or confirm information were the utility information and the population and urban demand projections.

Utility Information

To accurately reflect historic, current and projected water supply practices by the utilities in the UEC Planning Area, the District initiated an exhaustive survey of all regional public and private water and wastewater utilities in the study area. The utilities were sent a questionnaire addressing existing and future customers, service areas, treatment technologies, average daily flows, treatment plant locations, number of wells, interconnects with other utilities, and planned expansions for their respective utilities. Follow-up telephone calls were made to those utilities who did not respond, or whose response was incomplete.

This information was tabulated in a computerized spreadsheet and checked against other District sources, such as permits and comprehensive planning documents, for accuracy. Where inaccuracies were found, additional follow-up contacts were made.

Population and Urban Demand Projections

Population projections were taken directly from the adopted local government comprehensive plans so that the UEC Water Supply Plan will be consistent with, and support, local and state growth management policies. This population was broken down by utility service area and was further adjusted to account for self supply. The District's population and per capita water demand calculations were mailed to local governments and utilities for their review.